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GLEN E BOOKS ESQ  
MATHEWS COLLINS SHEPHERD & GOULD PA  
100 THANET CIRCLE SUITE 306  
PRINCETON NJ 08540-3674

EXAMINER

ALANKO, A

ART UNIT

PAPER NUMBER

1746

DATE MAILED:

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademark**

# Office Action Summary

Application No.

09/305,722

Applicant(s)

BAO ET AL.

Examiner

Anita K Alanko

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 16-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some \* c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 18) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_

*Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-15, drawn to a method for patterning, classified in class 216, subclass 2+.
  - II. Claims 16-18, drawn to a patterned substrate, classified in class 428, subclass 209.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by a different method such as by etching or coating without the use of a rotatable stamp, for example reactive ion etching or chemical vapor deposition. The process can be used to make a different product such as a decorative article.

2. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
3. This application contains claims directed to the following patentably distinct species of the claimed invention: patterning by
  - A. etching (claims 1-15), or
  - B. depositing (claims 1-7, 13-15).

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the

limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

4. During a telephone conversation with Glen Books on July 17<sup>th</sup> with Cathy Lam, and on August 21<sup>st</sup> with Anita Alanko a provisional election was made without traverse to prosecute the invention of the method, Group I, species A, claims 1-15. Affirmation of this election must be made by applicant in replying to this Office action. Claims 16-18 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

#### ***Claim Rejections - 35 USC § 112***

6. Claims 8 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention. Line 2 of claims 8 and 11 should cite "selected from the group consisting of" in order to have proper Markush group terminology. Also, in claim 8, all members of the Markush group are not mutually exclusive of each other, and thus are not proper. The second and third members are ferricyanides, which overlap with the first member of ferricyanide. The members that overlap may be simply deleted.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-2, 6-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Xia et al (Adv. Mater. 1996).

Xia discloses a method for forming at least one patterned layer on a substrate comprising the steps of:

- providing a rotatable stamp ("PMDS" stamp, Fig. 1a) having relief geometries (p. 1015, lines 6-10) on its surface to define a stamping surface;
- applying ink ("ink solution" p. 1016, first column, line 13) to the surface of the rotatable stamp to define an inked stamping surface;
- rotating the rotatable stamp as the substrate (Silicon) is placed in contact with the stamp to impress an inked pattern ("SAM", Fig. 1b) on the substrate as defined by the inked stamping surface; and

- patterning the substrate by etching material (“selective wet etching”, Fig. 1c) from the substrate, wherein the inked stamping surface guides the etching in a geometry to define the patterned layer useful in fabricating an electronic device.

As to claims 2 and 12, see step 1c, wherein the substrate is inherently passed to a wet chemical means for removing the inked pattern from the substrate.

As to claims 6-7, 11, the substrate is a multi-layered film of titanium adhesive layer and gold or silver metal layer.

As to claim 8, Xia discloses to use an aqueous ferricyanide solution for the etching step (p.1016, second column, lines 1-4).

As to claims 9 and 10, Xia discloses to form an exposed region where no ink is present and a protected region on the substrate where ink covers the substrate, and that the step of patterning comprises etching the metallic layer from the substrate at the exposed region (Fig. 1c).

9. Claims 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Ford (U.S. Patent No. 4,126,511).

Ford discloses a method for forming at least one layer on a substrate for use in fabricating an electronic device, the method comprising the steps of:

- providing the substrate in the form of a flexible sheet (Strip S, col. 2, line 17);
- providing a rotatable stamp 30 mounted on an axle (Fig. 2), the stamp having an outer surface with relief geometries 40 to define a stamping surface (col.2, lines 48-61);
- rotating the rotatable stamp on an inking pad 28 to apply ink to the stamp and define an inked stamping surface;

- rotating the rotatable stamp as the substrate is placed in contact with the stamp so that an inked pattern ("SS") corresponding to the inked stamping surface is formed on the substrate (col.2, lines 60-61);
- passing the substrate to an apparatus for etching material from the substrate, wherein the inked stamping surface guides the etching of the material in a geometry that defines a pattern on the substrate (col.2, lines 63-66);
- further comprising the steps of attaching the sheet at one end to a first reel 6 and at the other end to a second reel 46 (Fig.2) so that the sheet may be passed from the first reel, to the rotatable stamp, and to the apparatus by unwinding the sheet from the first reel and winding the sheet onto the second reel, and
- wherein the inking pad is cylindrical (Fig.2), and ink is simultaneously placed in contact with the stamp and the substrate to provide for continuous rotary printing.

### *Claim Rejections - 35 USC § 103*

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Xia et al (Adv. Mater.1996) in view of Biebuyck et al (U.S. Patent No. 5,925,259).

The discussion of Xia from above is repeated here. As to claims 3 and 4, Xia does not disclose how the relief geometries are formed. Biebuyck teaches a useful method for forming

relief geometries in a rotatable roller ("stamp" 25, col.3, line 3). The relief geometries are formed by:

- (a) casting a liquid onto a surface having relief geometries 252 thereon (coating the PDMS film, col. 6, line 50);
- (b) solidifying the liquid to define a solid film (PMDS, the curing step, col.6, lines 50-51); and
- (c) lifting the solid film from the surface and bonding to the member 251 (col.6, lines 51-52).

Biebuyck does not disclose in step c of claim 3 that the member 251 is rolled over the solid film. However, it would have been obvious to one with ordinary skill in the art to roll the member over the film when lifting it from the surface in the method of Biebuyck because Biebuyck teaches that the member can be in the form of a roller, and when a roller is used, it is most easily processed by rolling.

It would have been obvious to one with ordinary skill in the art to use the modified method of Biebuyck to form the relief surfaces in the method of Xia because Biebuyck teaches that this is an efficient way to form relief surfaces for transferring liquid from a rotatable stamp to a substrate.

As to claim 5, Xia does not disclose to expose the elastomeric film to oxygen plasma before the member is rolled over the film. Examiner takes official notice that it is conventional in the art to plasma etch, for example by oxygen plasma etching, a surface in order to improve the bonding properties of the surface to a subsequent surface. It would have been obvious to one with ordinary skill in the art to oxygen plasma etch the surface in the modified method of Xia because etching is a conventional technique to improve surface bonding properties.



*Conclusion*

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Marshall (5499731) is cited for its discussion of resinous ink. Maracas et al is cited for its discussion of self-assembled monolayers and methods of printing them. Biebuyck et al (5817242) is cited to show a method of printing features below one micron in critical dimension. Wilson and Marshall (2099697) are cited to show methods of continuous printing. Blanding et al is cited to show printing of ink resist. Kuwabara et al is cited to show a method of continuous deposition (Fig.5).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K Alanko whose telephone number is 703-305-7708. The examiner can normally be reached on Monday-Friday, 9:30-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 703-308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7719 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

*Anita Alanko*  
Anita Alanko  
Patent Examiner  
Art Unit 1746

AKA  
August 22, 2000